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資　料　(NOTE)

樹　木　成　分　集　(Ⅱ)

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Akira Sato and Koichiro Kitao : Accessory Wood Constituents (II)

この成分集（II）は前回（I）（本誌，No. 34, 237～248 (1965)）の追補である。前回に含まれなかつた邦産針葉樹種のほかにあらたに外国産針葉樹種を加え，広葉樹ではほとんどが前回集録以降の新しい文献によつたが，*Prunus* 属をはじめ一部にさかのぼつて採録したものもある。最近の文献についてはおおむね，今回で記載し終ることになるが，さらに機会を得て，戦前の文献その他の採録を行ない，この試みをより完全なものにしたいと考えている。

なお，両回を通じてお気付の点につき御指摘賜わりたいと念じている。

本文中使用の略号は下記の通りである。

1. 樹種配列は学名のアルファベット順
2. 分析項目　c…セルロース，hc…ホロセルロース，pent…ペントザン，ex…抽出物・数字はアルコール・ベンゼン可溶物量，括弧内は水抽出物量
3. 文献略号

A B I P C, Abstract Bulletin of the Institute of Paper Chemistry (Appleton)
A. I., Annual Index of the Reports on Plant Chemisty, Hirokawa Pub. Co., Tokyo)
C., Chemisches Zentralblatt
K., Konstitution u. Vorkommen der org. Pflanzenstoffe (Karrer)
農化, Bull. Agr. Chem. Soc. Japan,
木工ハンド，木材工業ハンドブック，(林業試験場編)
木材誌, J. Japan Wood Res. Soc.
日林誌, J. Japan. Forestry Soc.
薬　誌, J. Pharm. Soc. Japan

Abies spp. モミ属 (樹脂) neoabietic acid, mono- and dihydroxy resin acids, A. I. (1960).

Abies alba Mill., silver fir, オウシュウモミ (葉) juniperic acid, maltol

Abies concolor Lindl. et Gord., white Colorado fir, (コルク) neutral 26 %, hydroxy fatty acids 18.8 %, polyphenol 26.7 %, ferulic acid 4.7 %, polysaccharide 8.2 %, lignin 15.6 %, diox. soluble suberin 48 %, H. L. Hergert, Forest Prod. J., **8**, 335 (1958). (樹皮) d-catechin, l-epicatechin, H. L. Hergert et al., J. Org. Chem., **18**, 521 (1953).

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Abies sachalinensis MAST., Sakhalinfir, トドマツ, (樹脂) neoabietic acid 5.60 %, abietic acid 8.01 %, dehydroabietic acid 1.25 %, 土師美智子, 木材誌, **7**, 98 (1961).

Abies sibirica LEDEB., Siberian fir (樹脂) neoabietic acid, A. I. (1960).

Aesculus turbinata BLUME トチノキ, (心材) β-sitosterol, fraxin, aesculetin, fraxetin, glucose. 近藤民雄, 古沢亘江, 農化, **29**, 952 (1955).

Agathis australis SALISB., kauri pine, (樹脂) agathen dicarbonic acid, C. R. ENZELL et al., Acta Chem. Scand., **19**. 913 (1965) ; (葉) α-pinene, limonene, camphor, citronellol, borneol, cineol, caurene (=α-podocarpene).

Artocarpus integrifolia L. f., keledang, (心材) norartocarpetin, artocarpesin, artocarpanone, cycloartocarpin, morin, cyanomaclurin, A.V.R.RAO and K. VENKATARAMAN, Tetrahedron L., No. 11, 663 (1965).

Callitris columellaris (心材) α-, β- and γ-eudesmol, cryptomeridiol, citronellic acid, guaiol, F. MUELL and P. RUDMAN, Chem. & Ind., 808 (1964).

Callitris glauca R. BROWN, Murray river pine, (葉) hinokiflavone, A. I. (1958).

Catalpa ovata G. Don, Chinese catalpa tree, キササゲ, β-sitosterol, ceroitic acid, vanillic acid, ferulic acid, p-hydroxybenzoic acid, p-hydroxy cinnamic acid, syringic acid, vanillin, glucose, mannose, xylose, rhamnose, 今村博之, 須田元茂, 木材誌, 8, 127 (1962), catalpalactone (=$C_{15}H_{14}O_4$, m.p. 105-106°), H. INOUE et al, Tetrahedron L., No.18, 1261 (1965).

Cedrus sp. (siberian cedar), (樹脂) abietic acid, mono-, and dihydroresin acids, A. I. (1960).

Cedrus atlantica MANETTI (葉, 球果) D-pinitol, A. I. (1958, 1959).

Cedrus deodara LOUD, Deodar ceder (葉, 球果) D-pinitol, A. I. (1959), (材) α- and γ-atlantone, ; longiborneol, himachalol (m.p. 67-68°), allohimachalol (m. p. 85-86°), S. C. BISARYA, and S. DEV, Tetrahedron L. No. 49, 3761 (1964).

Cephalotaxus drupacea SIEB. et ZUCC. イヌガヤ, (葉) kayaflavone, A. I. (1958).

Cephalotaxus nana NAKAI (葉) kayaflavone, A. I. (1958).

Cercidiphyllum japonicum SIEB. et ZUCC. カツラ, (葉) aromadendrin (=katsuranin).

Chamaecyparis obtusa ENDL. ヒノキ, hinokiresinol $C_{17}H_{16}O_2$ (m.p. 102-103°) Y. HIROSE et al., Tetrahedron L. No. 41, 3665 (1965).

Chamaecyparis obtusa ENDL. *var breviramea* MAST. (葉) hibalactone, A. I. (1960).

Chamaecyparis pisifera Endl. サワラ (葉) d-catechin, quercitrin, distylin (=d,l-taxifolin) M. HASEGAWA, H. NAKAMURA and J. TSURUNO 日林誌, **37**, 488 (1955).

Chamaecyparis taiwanensis MASAMUNE et SUZUKI タイワンヒノキ chamaesin (=tropolone derivative) A. I. (1958), (精油) m-isopropylphenol, thymol, carvacrol, A. I. (1960).

Chamaecyparis thyoides BRITT. ヌマヒノキ (心材) carvacrol methyl ether, α-cedrene, cuparene, thujopsene, cedrol, widdrol, cuparenic acid, hinokiic acid, widdringtonia acid II, A. I. (1960).

Cinnamomum camphora SIEB. Camphorwood クスノキ s-guaiazulene 宮崎信ら, 木材誌, **1**, 64 (1955).

Cryptomeria japonica D. DON スギ (葉) hinokiflavone monomethyl ether, hinokiflavone dimethylether, N. KAWANO and H. MIURA, Chem. & Ind. (1964) 2020; sugiresinol (=S_1) hydroxysugiresinol (=S_2) 甲斐勇二, 木材誌, **11**, 23 (1965); quercimeritrin (=quercetin-7-monoglucoside) 近藤民雄ら, 農化, **28**, 290 (1954).

Cupressus funebris Endl., Chinese weeping cypress (葉) hinokiflavone A. I. (1958).

Cupressus sempervirens L., Mediterranean cypress (葉) cupressuflavone (=8, 8″-biapigeninyl) V. V. S. MURTI, P. V. RAMAN and T. R. SESHADRI, Tetrahedron L., No. 40, 2995 (1964).

Cupressus torulosa D. DON, Hymalayan cypress (葉) cupressuflavone (=8, 8″-biapigeninyl) V. V. S. MURTI, P. V. RAMAN and T. R. SESHADRI, Tetrahedron L. No. 40, 2995 (1964).

Cycas revoluta THUNB. ソテツ (葉) sotetsuflavone, A. I. (1958, 1960), estolidewax (composed of juniperic acid, 1, 16-hexadecanediol, sabinic acid, nonacosane, noncosan-10-one, nonacosan-10-ol, octacosan-1-ol, 薬誌, **79**, 51 (1959)), (種子) laminaribiose, A. I. (1960) (果実) cycasin, neocycasin A and B, macrozamin, A. I. (1960).

Dacrydium biforme PILGER, manoao (樹脂) isopimaric acid, manoyl oxide, A. I. (1960).

Dacrydium cupressinum SOLAND., rimu (樹皮) totarol, β-sitosterol, sequoyitol, A. I. (1960), (精油) rimuene (=diterpene) R. E. CORBETT and S. G. WYLLIE, Tetrahedron L. No. 29, 1903 (1964).

Dacrydium laxifolium HOOK. f., phyllocladene, A. I. (1960).

Fagara ailanthoides ENGL. カラスノサンショウ 6, 7, 8-trimethoxy coumarin, 6, 7-dimethoxy coumarin, β-sitosterol, 長谷川正男, 日林誌, **42**, 222 (1960).

Ginkyo biloba L. イチョウ (葉) shikimic acid, α-hexenal, A. I. (1960). ginnol (=nonacosan-10-ol), nonacosane, nonacosan-10-one, octacosanol, H. AGETA, 薬誌, **79**, 58 (1959) (心材) d-sesamin, bilobanone, A. I. (1958).

Hardwickia pinnata ROXB., piney, (樹脂) copaene (4.5%), caryophyllene (75%), humulene (13%), caryophyllen oxide (2.5%), humulene oxide-I, and-II, β-caryophyllene alcohol (1%), hardwickiic acid $C_{20}H_{28}O_3$, kolavic acid $C_{20}H_{30}O_4$, kolavenic acid, kolavenol, R. MISRA, R. C. PANDEY, S. DEW, Tetrahedron L. No. 49, 3751 (1964).

Juniperus sp. (精油) α-pinene, sabinene, p-cymene, 4-terpineol, geraniol, citral, linalool, A. I. (1960).

Juniperus cedrus L., Canary island juniper, (心材) thymoquinone, thujopsene, cuparene, cedrol, widdrol, δ-cadinol, "widdringtonia acid II", nootkatin, β-thujaplicin, carvacrol, A. I. (1960).

Juniperus communis L., common juniper, トショウ, xanthoperol (=9, 10-diketoferu-

ginol), longifolene, longiborneol, (果実) sabinene camphene, α-terpinene, γ-terpinene, terpinolene, α-terpineol, ethyl caprylate, A. I. (1960).

Juniperus phoenicea L., Phoenician juniper, (心材) thujopsene, cuparene, cedrol, widdrol, "widdringtonia acid II", hinokiic acid, nootkatin, β-thujaplicin, carvacrol, A. I. (1960).

Juniperus thurifera L., Spanish juniper, (心材) α-cedrene, thujopsene, cuparene, cedrol, carvacrol, mootkatin, β-thujaplicin, hinokiic acid, "widdringtonia acid II" A. I. (1960).

Juniperus virginiana L., Virginian pencil cedar, エンピツビャクシン (精油(商品)) cuparene, cedrol, widdrol, α-cedrene, thujopsene, A. I. (1960).

Larix sp. (樹脂) dihydroxyresin acid, tricarboxylic acid, A. I. (1960).

Larix dahurica Turcz., Dahurian larch, (材) arabogalactan, A. I. (1959).

Larix decidua Mill., European larch, (材) arabogalactan, A. I. (1959, 1960).

Larix europaea D. C. (葉) (球果) d-pinitol, sequoyitol, A. I. (1959), (樹脂) larixyl acetate, larixol, A. I. (1960).

Larix layllii Parl. (材) arabogalactan, A. I. (1959); β-sitosterol, 2-nonanol, phthalic acid, palmitic acid, stearic acid, oleic acid, linolenic acid, linolenic acid, A. I. (1960).

Larix leptolepis Gord. (=L. *kaempferi* Sarg.) カラマツ (樹脂) dextropimaric acid, dihydroabietic acid, abietic acid, neoabietic acid, palustric acid, A. I. (1958), (葉) non-estolide wax, A. I. (1958).

Libocedrus macrolepis Benth. et Hook. f. (=L. *formosana* Froin) (材) shonanic acid, thujic acid, chaminic acid (m.p. 105–106°), A. I. (1960).

Machilus thumbergii Sieb. et Zucc. タブノキ (心材) lignoceric acid, quercetin, taxifolin, d, l-catechin, galactose, xylose, mannose, arabinose, rhamnose, 近藤民雄ら, 農化, **30**, 717 (1956).

Mangifera Indica L., (樹脂) mangiferolic acid (=$C_{30}H_{48}O_3$), S. Corsano and E. Mincione, Tetrahedron L., No. 28, 2377 (1965).

Ostrya japonica Sarg. アサダ (材) β-sitosterol, asadanin (=$C_{19}H_{20}O_6$, m.p. 236–239°), triterpene ketoester (=$C_{31}H_{48}O_3$, m.p. 183–185°), triterpeneketone (=$C_{30}H_{50}O_2$, m.p. 200–205°), 安江保民ら, 木材誌, **11**, 111 (1965); structure of asadanin, 安江保民ら, 木材誌, **11**, 146; 153; 202 (1965).

Picea abies Karst. (=*P. excelsa* Link.) ドイツトウヒ (樹皮) piceatannol, piceatannol glucoside, fructose, glucose, sucrose, raffinose, stachyose, 3, 3′, 4′, 5′, 7-pentahydroxyflavone, 3, 3′, 4′, 5, 7-pentahydroxyflavone, tannin and phenolic components, A. I. (1959, 1960); (精油) α- and β-pinene, limonene, dipentene, Δ^3-carene, p-cymene, A. I. (1959), (樹脂) palustric acid, (材) galactan, glucomannan, A. I. (1959, 1960).

Picea asperata Mast. (葉, 球果) D-pinitol, A. I. (1959).

Picea bicolor Mayr. var *aricularis* Schirazawa et Koyama (葉) resveratrol, 3, 4-

dihydroxyacetophenone, estolide wax, A. I. (1959).

Picea glauca Voss. (材) glucomannan, A. I. (1960).

Picea jezoensis Carr. エゾマツ isodextropimaric acid, pinoresinol, A. I. (1959).

Picea mariana Britt. St. et P., sequoyitol, A. I. (1959).

Picea pungens Engelm. var *glauca* Beiss. ニオイモミ, 3, 4-dihydroxyacetophenone-3-β-D-glucoside, A. I, (1960).

Picea sitchensis Trautv. et Mey, hemicellulose, A. I. (1959, 1960).

Pinus sp. (枝条) quinic acid, shikimic acid, A. I. (1959); longifolene, A. I. (1959), structure of palustric acid, dihydroabietic acid, abietic acid, dehydroabietic acid, dextro pimaric acid, A. I. (1960).

Pinus ayacahuite Ehrenb., Mexican whithe pine (葉, 球果) D-pinitol, sequoyitol, A. I. (1959).

Pinus banksiana Lamb., Jack pine, (心材) isopimaric, abietic, dehydroabietic and neoabietic acids, glycerides of oleic, linoleic and linolenic acids, pimaric, sandaracopimaric, myristic, palmitic, stearic, and palmitoleic acids, fatty acid ester of β-sitosterol, α-terpineol, pinocembrin, pinobanksin, pinosylvin monomethylether, pinosylvin, α- and β-pinene, benzoic acid, traces of methylbenzoate, camphene, limonene, β-phellandrene, cis-*p*-menthan-8-ol, E. von Rudloff and A. Sato, Can. J. Chem., **41**, 2165 (1963) (樹皮) serratendiol (=pinusenediol, $C_{30}H_{50}O_2$) J. W. Rowe, Tetrahedron L., No. 34, 2347 (1964).

Pinus contorta Dongl., lodgepole pine (樹皮) 13-epimanool (a new diterpene alcohol) J. W. Rowe and J. H. Scroggins, J. Org. Chem., **29**, 1554 (1964).

Pinus lambertiana Dongl., (=*laricio* Poir) (樹皮) serratendiol, J. W. Rowe, Tetrahedron L., No. 34, 2347 (1964), (葉, 球果) sequoyitol, A. I. (1959).

Pinus montana Mill. (*P. mugo* Turra), singleleaf pinyon, (葉, 球果) D-pinitol, sequoyitol A. I. (1959).

Pinus nigra Arn., Corsican black pine (葉) D-pinitol, A. I. (1959), (樹皮) fructose, glucose, sucrose, raffinose, stachyose, (種子) 酵素 A. I. (1959).

Pinus palustris Mill. ダイオウマツ (葉, 樹皮) fructose, glucose, sucrose, raffinose A. I. (1959);(樹皮) serratendiol, J. W. Rowe, Tetrahedron L., No. 34, 2347 (1964).

Pinus ponderosa Dongl., Arizona pine (精油) α-pinene, β-pinene, limonene, terpinolene, cadinene, longifolene, undecane, 3-carene, A. I. (1959).

Pinus pumila Regel ハイマツ (心材) pinosylvin monomethylether, dihydropinosylvin monomethylether, chrysin, tectochrysin, pinocembrin, arabinose, pinitol, 近藤民雄ら, 農化, **29**, 110 (1955).

Pinus radiata D. Don, radiata pine, (精油) 2-pinene, camphene, limonene, terpinolene, β-pinene, o-cymene, A. I. (1960).

Pinus resinosa Ait., red pine, (心材) pinosylvin monomethylether, oleic, linoleic,

dehydroabietic, isopimeric acid, pinosylvin, β-sitosterol ester, benzoic acid, palmitic, palmitoleic, stearic, linoleic, pimaric, sandaracopimaric, abietic and neoabietic acids, α-pinene, β-pinene, myrcene, limonene, γ-terpinene, terpinolene, camphor, cis-p-menthan-8-ol, terpinen-4-ol, α-terpineol, glucose, xylose, A. SATO and E. von RUDLOFF, Can. J. Chem., **42**, 635 (1964).

Pinus strobus L., yellow pine (樹皮, 葉) fructose, glucose, sucrose, raffinose, stachyose, (葉) D-pinitol, sequoyitol, A. I. (1959).

Pinus sylvestris L., Sctots pine (葉) glucose, fructose, sucrose, melibiose, raffinose, *myo*-inositol, pinitol, cellobiose, laminaribiose, glucopyranosylfructose, glucopyranosylmannose, galactose, arabinose, xylose, glucomannan, araboxylan, A. I. (1958). (葉) sequoyitol, A. I. (1959). (材) glucomannan; ω-hydroxypropiognaiacone, p-hydroxybenzoic acid, vanillic acid, ferulic acid, protocatechnic acid by p.p.c., araboxylan (樹脂) palustric acid, dextropimaric acid, A. I. (1959, 1960).

Pinus taeda L., Loblolly pine テーダマツ (材) polysaccharide, A. I. (1959), (樹皮) serratendiol, J. W. ROWE Tetrahedron L., No. 34, 2347 (1964).

Platycarya strobilacea SIEB. et ZUCC., ノグルミ (心材) ellagic acid, gallic acid, glucose, xylose, rhamnose, 近藤民雄ら, 農化, **30**, 281 (1956).

Prunus aequinoctialis MIYOSHI (心材) naringenin, aromadendrin, sakuranetin, eriodictyol, genistein, prunetin, verecundin, prunin, genistin, aequinoctin (=chrysin-7-glucoside), M. HASEGAWA, J. Am. Chem. Soc., **79**, 1738 (1957).

Prunus campanulata MAXIM. (材) naringenin, taxifolin, eriodictyol, M. Hasegawa and T. Shirato, J. Am. Chem. Soc., **76**, 5560 (1954).

Prunus donarium Sieb. *var. spontanea* MAKINO ヤマザクラ (材) eriodictyol, genkwanin, sakuranin, isosakuranin, M. HASEGAWA and T. SHIRATO, J. Am. Chem. Soc., **77**, 3557 (1955).

Prunus donarium SIEB. *var. spontanea* MAKINO *subvar, specinosa* MAKINO オオシマザクラ (材) sakuranin, glucogenkwanin, M. HASEGAWA and T. SHIRATO, J. Am. Chem. Soc., **76**, 5559 (1954).

Prunus Maximowiczii RUPR. ミヤマザクラ (心材) d-catechin, naringenin, sakuranetin, eriodictyol, taxifolin, aromadendrin, prunetin, genistein, chrysin, M. HASEGAWA, J. Am. Chem. Soc., **79**, 1738 (1957).

Prunus nipponica MATSUM. ミネザクラ (心材) d-catechin, naringenin, sakuranetin, eriodictyol, taxifolin, prunetin, genistein, prunin, chrysin, aequinoctin, genistin, M. HASEGAWA, J. Am. Chem. Soc., **79**, 1738 (1957).

Prunus verecunda KOEHNE (材) verecundin (=pinocembrin-5-glucoside), genistein, prunetin, pinocembrin, isosakuranetin, isosakuranin, naringenin, genkwanin, eriodictyol, taxifolin, M. HASEGAWA and T. SHIRATO, J. Am. Chem. Soc., **79**, 450 (1957).

Prunus yedoensis MATSUM. ソメイヨシノ (樹皮) sakuranin (=4, 5-dihydroxy-7-

methoxyflavone), 朝日奈泰彦, 薬誌, **28**, 213 (1908), (心材) genkwanin, naringenin, d-catechin, (辺材) d-catechin, a glucoside of naringenin, M. HASEGAWA and T. SHIRATO, J. Am. Chem. Soc., **74**, 6114 (1952).

Podocarpus chinensis SWEET ラカンマキ (葉) kayaflavone, A. I. (1958).

Podocarpus ferruginens D. DON, miro (樹脂) sugiol (=isomiropinic acid), isopimaric acid (=miropinic acid) A. I. (1960).

Podocarpus macrophylla D. DON イヌマキ (葉) kayaflavone, A. I. (1958).

Podocarpus nagi PILG., ナギ (葉) kayaflavone, A. I. (1958), (材) podototarin, totarol, β-sitosterol, 16-carboxytotarol, mannose, galactose, 高橋利夫, 安江保民, 今村博之, 宮崎信, 本田収, 木材誌, **11**, 27 (1965).

Podocarpus nivalis HOOK., phyllocladene, A. I. (1960).

Pseudolarix kaempferi GORD. イヌカラマツ (葉) non-estolide wax, D-pinitol, A. I. (1958, 1959).

Pseudotsuga japonica BEISSN., トガサワラ, taxifolin (=distylin), 日林誌, **33**, 17 (1951).

Pseudotsuga menziesii FRANCO. (=*P. douglasii* CARR.) Douglas fir (葉) sequoyitol, A. I. (1959).

Quercus championi BENTH. ホンコンガシ (葉) hop-17(21)-en-3-β-ol, hop-17(21)-en-3-β-yl acetate, β-amyrenyl acetate, friedelin, friedelen-3-ol, H. R. ARTHUR, W. H. HUI, C. N. LAM and S. K. SZETO, Aust. J. Chem., **17**, 697 (1964).

Rhododenron maximum L. (樹皮) d-betuligenol (d-4-(p-hydroxyphenyl)-2-butanol), W. H. TALLENT, J. Org. Chem., **29**, 988 (1964).

Sciadopitys verticillata SIEB. et ZUCC. コウヤマキ (葉, 球果) sciadopitysin, sequoyitol, A. I. (1959), (精油) cedrene, cedrol, phyllocladiene, isoeugenol methylether, sciadin, methylsciadopate, vericillol (=$C_{20}H_{34}O$, m.p. 104–105°), H. ERDTMAN, T. NORIN, M. SUMIMOTO and A. MORRISON, Tetrahedron L., No. 51, 3879 (1964), (心材) sciadin, methylsciadopate, 住本昌之ら, Tetrahedron **19**, 643 (1963), structure of methylsciadopate, 住本昌之ら, Chem. & Ind. 1928 (1963); Tetrahedron **20**, 1427 (1964).

Swartzia Madagascariensis DESV. (心材) pterocarpans (=coumaranochromans), S. H. HARPER, A. D. KEMP and W. G. E. UNDERWOOD, Chem. & Ind. 562 (1965).

Taxodium distichum RICH. ヌマスギ (葉) avicularin, quercetin, sequoyitol, distichin (=$C_{21}H_{20}O_{11}\cdot 1/2\,H_2O$, m.p. 261–263°, a new glycoside) A. I. (1960).

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